

**45-47 Garman Road, Tottenham**

**S106 Energy Plan (Revised Energy Statement)**

Ensphere Group Ltd on behalf of  
Shurgard UK Ltd



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# 45-47 Garman Road, Tottenham

## S106 Energy Plan (Revised Energy Statement)

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### Quality Assurance Approval Status

This document has been prepared and checked in accordance with Ensphere Group Ltd's Quality Management System.

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| Final  | V1       | Danielle Cawley | Pete Jeavons | September 2023 |

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## 1. Executive Summary

- 1.1 This S106 Energy Plan (Revised Energy Statement) presents the energy strategy for the proposed development at 45-47 Garman Road, Tottenham, N17 0UR.
- 1.2 Planning permission has been granted for the redevelopment of the site to provide a self-storage facility (Use Class B8) with associated car and cycle parking, refuse storage, landscaping and other associated works ancillary to the development.
- 1.3 Consideration has primarily been given to the planning policy context and other requirements prior to establishing a strategy based upon the energy hierarchy; with a priority given to energy reduction and efficiency. Renewable and low carbon technologies have also been considered in the context of their technical feasibility and financial viability.
- 1.4 The following is therefore proposed:
  - High performance building fabric and energy efficient lighting, services and equipment.
  - Heat pumps for space heating in the office areas.
  - Roof mounted PV.
- 1.5 The development will satisfy the Council target for an on-site carbon saving of >35% relative to Part L 2021. Residual emissions will be offset with a Carbon Offset payment. Energy efficient measures will target a >15% reduction; with renewables accounting for >30% carbon reduction.
- 1.6 As the proposed system is fully electric, the development will effectively become net zero in line with the decarbonisation of the National Grid.
- 1.7 A copy of the GLA Carbon Emission Reporting Spreadsheet is appended to this report outlining the savings at each stage of the Energy Hierarchy.
- 1.8 Overall, the proposed energy strategy is considered consistent with the National Planning Policy Framework, London Plan and policies of the Council. When implemented, the scheme will provide an efficient and low carbon development.

## 2. Introduction

- 2.1 Ensphere Group Ltd was commissioned by Shurgard UK Ltd to produce a S106 Energy Plan (Revised Energy Statement) for the proposed development at 45-47 Garman Road, Tottenham, N17 0UR.

### Site and Surroundings

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- 2.2 The application site (the 'Site') is located on the corner of Garman Road, Sedge Road and Watermead Way, in the Northumberland Park Ward, falling under the jurisdiction of London Borough of Haringey.
- 2.3 As existing, the 0.25ha Site comprises a single-storey warehouse in industrial/retail use with ancillary office/welfare facilities. The building shares a party boundary with the adjacent property – a similar styled warehouse and both were constructed in the 1950s.
- 2.4 Garman Road borders the site to the west and Sedge Road marks the northern boundary, with a vegetated verge separating the site and Sedge Road. The verge widens as the site boundary moves toward Watermead Road. This marks the eastern boundary of the site.

### Development Proposals

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- 2.5 *Redevelopment of the site to provide a self-storage facility (Use Class B8) with associated car and cycle parking, refuse storage, landscaping and other associated works ancillary to the development (LPA Ref: HGY/2022/2293).*

### Planning Context

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- 2.6 Planning permission was granted for the above proposals in April 2023, subject to a set of Conditions. Pertinent to this report is Condition 14 which requires that 'prior to above ground construction, a revised Energy Strategy shall be submitted to and approved by the Local Planning Authority'.
- 2.7 Also, as part of the S106 Agreement Obligation 1.1, an Energy Plan is required to be submitted and approved in writing by the Council pre-commencement of the development.

### Report Objective

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- 2.8 The objective of the S106 Energy Plan (Revised Energy Statement) is to provide further details of how energy efficiency, low carbon and renewable technologies have been considered and implemented as part of the energy strategy.

### 3. Assessment Methodology

- 3.1 The assessment methodology follows the Energy Hierarchy, on the basis that it is preferable to firstly minimise carbon dioxide emissions through reduced energy demand; prior to considering low carbon and renewable energy supply options.
- 3.2 The tiers of the Energy Hierarchy are:
- Be Lean                      Demand Reduction
  - Be Clean                    Use Energy More Efficiently
  - Be Green                    Use Renewable Energy
  - Be Seen                     Monitor, Verify & Report
- 3.3 Where opportunities to improve the efficiency of the design have been maximised, consideration is then given to the second principle whereby priority is given to the efficient use of energy. This is on the basis that low carbon technologies can be cost-effective and provide significant carbon savings when compared to conventional technologies.
- 3.4 The third principle of the hierarchy promotes the use of renewable technologies. Whilst these technologies can be relatively expensive to install, they do offer the potential to significantly reduce carbon emissions.
- 3.5 Following the application of renewable technologies, the final tier of the Hierarchy requires monitoring, verification and reporting on energy performance.
- 3.6 The following sections of the report review the planning policy requirements prior to establishing a baseline from which the principles of the Energy Hierarchy are applied.

## 4. Planning Context

4.1 Local planning policy relevant to sustainable development is considered below:

### National Context

#### National Planning Policy Framework (2021)

4.2 The National Planning Policy Framework (NPPF) was updated in July 2021. Paragraph 7 of the revised NPPF includes reference to the following:

7. *“The purpose of the planning system is to contribute to the achievement of sustainable development.”*

4.3 Chapter 14 of the NPPF includes consideration of climate change and the use and supply of renewable and low carbon energy. Paragraph 152 states:

*“The planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience; encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure.”*



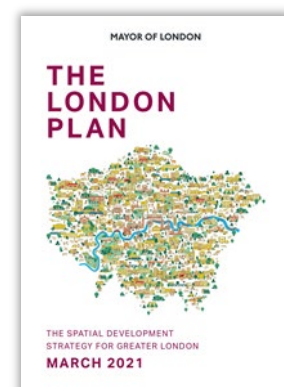
#### Planning Practice Guidance (2016; updated 2022)

- Climate Change - Advises how planning can identify suitable mitigation and adaption measures in plan-making and the application process to address the potential for climate change.
- Renewable and Low Carbon Energy - The guidance is intended to assist local councils in developing policies for renewable energy in local plans, and identifies the planning considerations for a range of renewable sources.

### London Context

#### London Plan (2021)

4.4 The London Plan is the overall strategic plan for London, it sets out an integrated economic, environmental, transport and social framework for the development of London over the next 20-25 years. The London Plan is part of the Development Plan and covers a range of planning issues. The presented policies provide



a vision for how London should sustainably grow and develop in the future. Policies considered pertinent to this report are presented below:

- Policy SI 1 (*Improving air quality*) – Development proposals should not lead to further deterioration of existing poor air quality.
- Policy SI 2 (*Minimising greenhouse gas emissions*) - Major development should be net zero-carbon and minimise emissions in accordance with the following energy hierarchy: be lean, be clean, be green, be seen. A minimum on site reduction of 35% beyond Building Regulations will be required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Any short fall with the zero carbon target should be addressed through a carbon offset payment. Development referable to the GLA should also calculate whole life-cycle carbon emissions.
- Policy SI 3 (*Energy infrastructure*) - Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system.
- Policy SI 4 (*Managing heat risk*) - Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems.

#### **Energy Assessment Guidance (2022)**

- 4.5 This guidance document explains how to prepare an energy assessment to accompany strategic planning applications referred to the Mayor as set out in London Plan Policy SI 2. It states that the purpose of an energy assessment is to demonstrate that the proposed climate change mitigation measures comply with London Plan energy policies, including the energy hierarchy.
- 4.6 Although primarily aimed at strategic planning applications, London boroughs are encouraged to apply the same structure for energy assessments related to non-referable applications and adapt it for relevant scales of development.

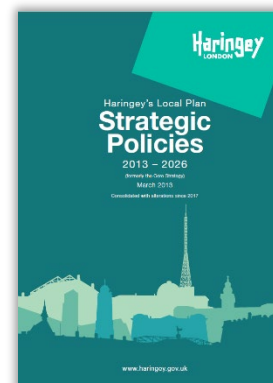
## Local Context

### Haringey's Local Plan, Strategic Policies (2013, updated 2017)

- 4.7 The Local Plan sets out the key planning policies for the future development of the borough up to 2026 and acts as the central document in the Borough's Development Plan.

- 4.8 The following policies are considered pertinent to this report:

- Policy SP4 (*Working towards a low carbon Haringey*) – In line with the London Plan, all new residential and non-residential development shall be zero carbon. All new non-residential development shall be built to at least BREEAM "Very Good" and aim for "Excellent". The policy encourages connection to district energy and, where viable, a reduction in predicted carbon dioxide emissions of 20% from on site renewable energy generation.

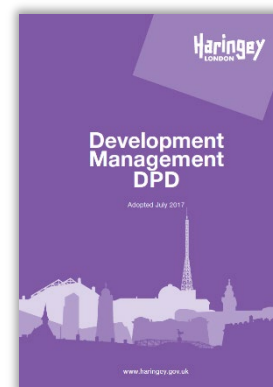


### Haringey's Development Management DPD – (July 2017)

- 4.9 This Development Plan Document (DPD) provides support to help contribute to the delivery of sustainable development in accordance with the Haringey strategy. It sets out criteria based policies against which planning applications will be assessed.

- 4.10 The following policies are highlighted:

- Policy DM21 (*Sustainable Design, Layout and Construction*) – Promotes new developments to consider and implement sustainable design, layout and construction techniques;
- Policy DM22 (*Decentralised Energy*) – encourages proposals that contribute to the provisions to contribute to decentralised energy networks;



### Sustainable Design and Construction SPD (2013)

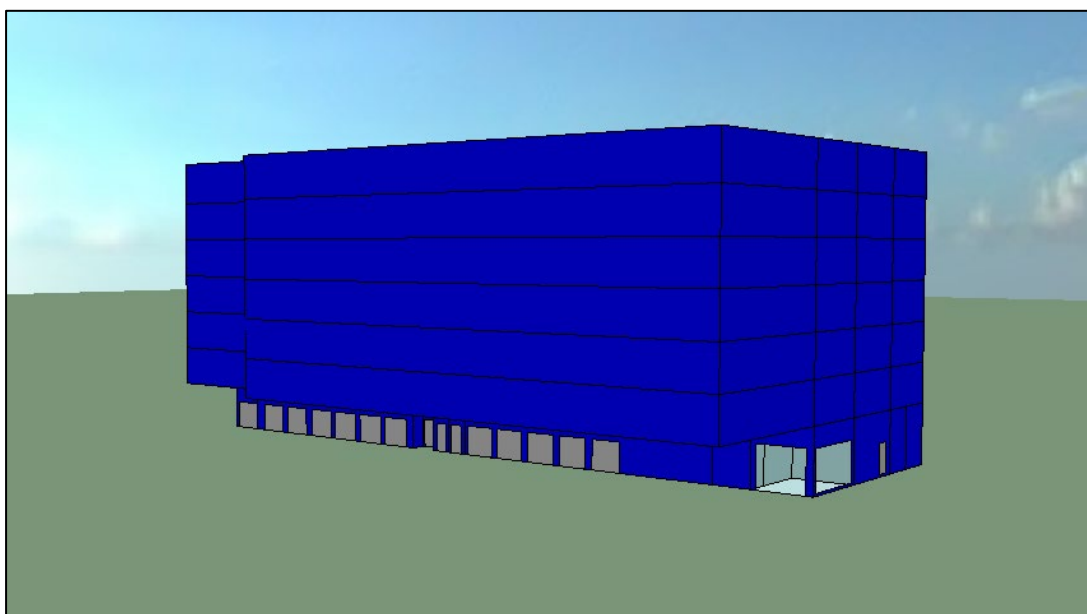
- 4.11 The purpose of the sustainable design and construction SPD is to provide advice on how development should be designed to ensure it is as sustainable as possible.
- 4.12 The topics that are discussed within this supporting document are to be incorporated within the sustainability Statement including energy and carbon, changing climate, flood risk, water, pollution, waste, conservation, biodiversity and transport.
- 4.13 The guidance states that on-site renewable energy generation should be considered within all major developments to reduce carbon dioxide emissions by at least 20 per cent.



## 5. Baseline Emissions

- 5.1 This section establishes the baseline position from which carbon savings are to be achieved. For the purposes of this assessment, and in line with GLA and local authority policies and guidance, the baseline position equates to regulated carbon dioxide emissions, assuming compliance with Part L 2021 of the Building Regulations, as calculated using approved compliance software.

**Figure 5.1** Energy Model



- 5.2 When determining this baseline, a notional specification based on Part L 2021 and the 'National Calculation Methodology (NCM) modelling guide' (2021) has been assumed to facilitate a consistent baseline and distinguish the reductions in carbon dioxide emissions that exceed Building Regulation requirements. This is to ensure consistency with the GLA guidance.
- 5.3 Regulated emissions are emissions which are covered by the Building Regulations and include the energy consumed in the operation of the space heating / cooling and hot-water systems, ventilation and internal lighting.
- 5.4 Unregulated emissions (i.e. those associated with cooking and all electrical appliances and other small power) have been separately calculated.
- 5.5 All emissions have been assessed using the SAP10.2 carbon factors. Non-domestic unregulated emissions have been taken from the unregulated emissions values generated by the SBEM model.

## 6. Demand Reduction (Be Lean)

- 6.1 This section considers features of the proposed design (including indicative performance levels) relevant to passive design and energy efficiencies.

### Passive Design

- 6.2 Passive design seeks to maximise the use of natural sources of heating, cooling and ventilation to maintain thermal comfort levels within the building.

### Building Massing & Orientation

- 6.3 The site size and proximity of neighbouring properties limits the orientation options, and the building is positioned to maximise the efficient use of the site. Nevertheless, the multi-storey design will help reduce the ratio of external surfaces to mass, meaning that heat will be better retained.

### Fabric Efficiency

- 6.4 Fabric efficiency concerns the thermal properties associated with the building fabric and construction.

### Insulation

- 6.5 Heat Transfer Coefficients, otherwise referred to as U-Values, are a measure of the rate of heat transfer through a building element over a given area, under standardised conditions (i.e. the rate at which heat is lost or gained through a fabric).
- 6.6 It is intended that the performance of the building fabric will incorporate relatively low U-Values to reduce the rate at which the buildings lose heat, preserving the heat within the space and reducing the requirement for mechanical heating.

**Table 6.1 Proposed Building Fabric U-Values (Non-Domestic)**

| Fabric Element | Part L2 (W/m <sup>2</sup> K) | Proposed (W/m <sup>2</sup> K) |
|----------------|------------------------------|-------------------------------|
| External Wall  | 0.26                         | ~0.20                         |
| Roof           | 0.18                         | ~0.12                         |
| Ground Floor   | 0.18                         | ~0.12                         |
| Windows        | 1.6                          | ~1.4                          |

### Air Tightness

- 6.7 A high level of air tightness is proposed and a level in the order  $3\text{m}^3/\text{h}/\text{m}^2$  is targeted, meaning that air infiltration between the internal and the external environment will be largely controlled, and space heating demand further reduced.

### Thermal Bridging

- 6.8 Thermal bridging is the penetration of the insulation layer by a highly conductive non-insulating material allowing rapid heat transfer from an interior to exterior environment (and vice versa). In well insulated buildings, as much as 30% of heat loss can occur through thermal bridges.
- 6.9 The building fabric shall be constructed so that there are no reasonably avoidable thermal bridges in the insulation layers caused by gaps within the various elements. This includes providing continuous insulation and cladding panels where possible, with insulated sheathing to avoid moisture build up if required.

## System Efficiencies

### Heating Systems

- 6.10 The Amendment Regulations and accompanying Approved Documents L: Volumes 1 and 2 have recently been published by the Ministry of Housing, Communities & Local Government. These contain revised carbon conversion factors to address the carbon intensity projections from the National Grid, with consideration given to the rapidly reducing emission rates associated with electricity in the context of the energy strategy. The newly adopted factors (SAP10.2) are presented below in relation to the previous SAP2012 and SAP10 factors, demonstrating the continued trend of electricity decarbonisation.

**Table 5.1 Carbon Factors SAP2012, SAP10 and SAP10.2**

|             | SAP2012                     | SAP10                       | SAP10.2                      |
|-------------|-----------------------------|-----------------------------|------------------------------|
| Gas         | 0.216kgCO <sub>2</sub> /kWh | 0.210kgCO <sub>2</sub> /kWh | 0.210 kgCO <sub>2</sub> /kWh |
| Electricity | 0.519kgCO <sub>2</sub> /kWh | 0.233kgCO <sub>2</sub> /kWh | 0.136kgCO <sub>2</sub> /kWh  |

- 6.11 The choice of heating systems is therefore mindful of the need for flexibility in consideration of the decarbonisation of the national grid.

### Ventilation / Cooling Systems

- 6.12 It is anticipated that the majority of the building will have the potential to be ventilated naturally via openable windows and / or trickle vents. This has the advantage of lower energy consumption; decreased costs associated with capital expenditure, operation and maintenance; and reduced noise impacts associated with mechanical plant. Mechanical ventilation heat recovery will also be included where necessary (in the office areas) to ensure that energy is used efficiently in cooler months, and when it is less desirable to open windows.

#### **Extract Fans**

- 6.13 It is anticipated that extract fans will be employed in WC and kitchen areas. The specific fan power (SFP) for these systems will be efficient and target a power consumption rate of 0.3W/l/s.

#### **Controls**

- 6.14 Time and temperature controls by suitable arrangement will be installed, in order to maximise the efficiency of the heating system.

#### **Lighting Efficiency**

- 6.15 Lighting design is intended to be highly efficient and in excess of Building Standards requirements. In the warehouse components it is intended that lighting efficacy shall be in excess of 130 lumens/circuit Watt, with 120 lumens/circuit Watt elsewhere. It is anticipated that presence detectors, daylight dimming and a timeclock will be installed to control internal lighting levels.
- 6.16 External lighting shall be highly efficient and employ controls to avoid energy wastage from unnecessary operation during daytime.

#### **Appliances**

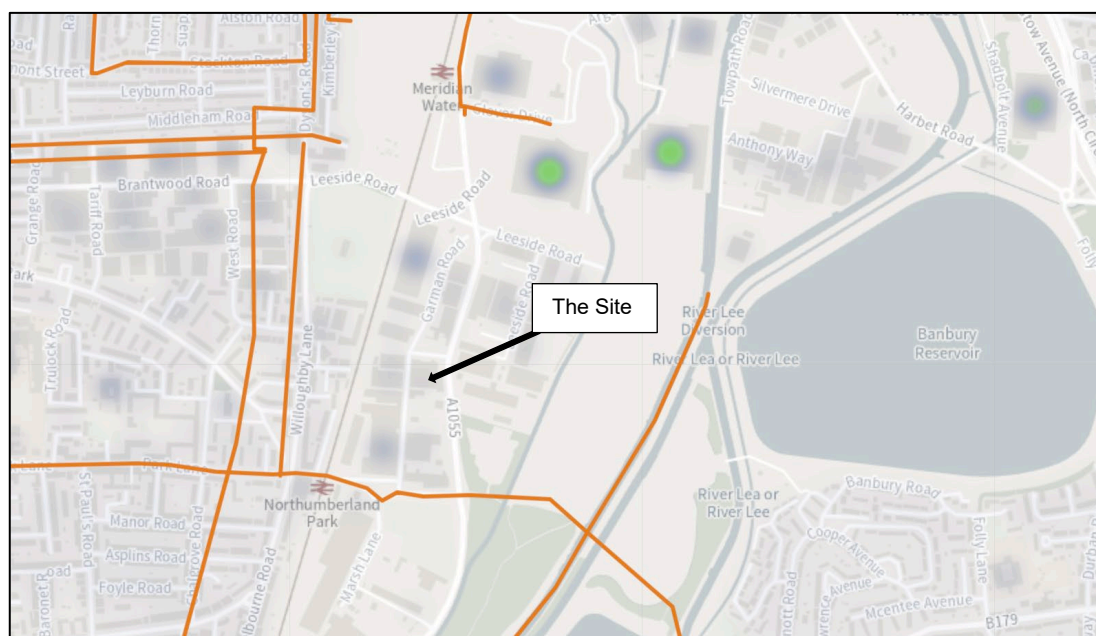
- 6.17 Appliances, such as fridges, may be included in the kitchen areas. It is proposed that the EU energy label of these appliances shall be A+ or greater.

## 7. Heating Infrastructure (Be Clean)

### District Energy Networks (DEN)

- 7.1 The term “district energy” applies to the energy distribution network, rather than the origins of the energy and the extent of any carbon savings will be largely determined by the energy source and heat losses on the network.
- 7.2 The London Heat Map is a tool provided by the Mayor of London to identify opportunities for decentralised energy projects in London and it builds on the 2005 London Community Heating Development Study.

**Figure 7.1 Extract from the London Heat Map**



- 7.3 The above extract from The London Heat Map shows the site located in an area of modest heat density. There are no existing District Energy Networks (DEN) in close proximity; a potential district energy network (orange line) is located approximately 250m south of the site. The Site is located within a zone defined as an Opportunity Area and a Heat Priority Area.

### District Energy Appraisal

- 7.4 In the absence of an existing DEN in close proximity to the Site and that the source of the heat is likely higher carbon than alternatives, it is not proposed to accommodate DEN as part of the energy strategy.

### Combined Heat & Power (CHP)

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- 7.5 Combined Heat & Power (CHP) systems generate electrical energy and provide the waste heat from the process to be used on site. They are typically gas-fired but can be run off alternative fuel sources.
- 7.6 This technology has historically been considered “low carbon” on the basis of the offsetting of Grid electricity and associated carbon. With a significantly reduced quantum of offset carbon anticipated going forward, the technology will likely prove more carbon intensive than a conventional gas-fired boiler on the basis that (a) carbon savings will be negligible or non-existent; and (b) the overall efficiency of CHP is generally lower than conventional boilers.

### CHP Appraisal

- 7.7 The Site has a very small heating demand (as most of the space is unheated). At this scale, it is generally not economic to install CHP as smaller CHPs tend to have lower electrical efficiencies and therefore higher carbon emissions. CHP also tends to emit higher levels of NO<sub>x</sub> than other heating systems; potentially adversely impacting local air quality.
- 7.8 A centralised CHP plant would create complex managerial arrangements and the administrative burden of managing CHP electricity sales to grid when the power is not required on site; combined with the relatively low unit price for small volumes of exported CHP electricity can create incentives for the CHP to be installed but not operated. CHP is therefore not proposed.

## 8. Renewable Technology Review (Be Green)

- 8.1 This section considers the potential application of low carbon and renewable technology options.

### Biomass Systems

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- 8.2 Biomass systems are heating systems that use agricultural, forest, urban and industrial residues and waste to produce heat and (depending on the system) electricity. At the building scale, biomass boilers using wood pellets or woodchips are the norm. Biomass should be sourced locally to limit “embodied carbon” associated with transport and ideally be derived from waste wood products to limit the take-up of agricultural land for fuel crops.

### Biomass Appraisal

- 8.3 Whilst technically feasible, heat demands are low and the absence of a readily available and diverse local fuel source creates risk associated with security of fuel supply. This has implications for operational viability.
- 8.4 Carbon emissions associated with cultivation, processing and transport of biomass are not normally considered in the context of planning or Building Regulations meaning that total carbon emissions are likely to be significantly higher than estimated. Biomass is also likely to cause other air quality impacts (e.g. particulates), which have implications for local air quality. Biomass is therefore not proposed.

### Heat Pumps

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- 8.5 Heat pumps draw thermal energy from the air, water or ground (“source”) and upgrade it to be used as useful heat at another location (“sink”). Heat pumps require electricity to operate (or gas in the case of Gas Absorption Heat Pumps) as mechanical input is required to convert harvested energy to useful heat and complete its transport to the “sink”.
- 8.6 Heat pumps are generally considered as renewable (despite an electrical or gas requirement) because the source of the heat is the ambient temperature in the exterior environment, which is ultimately heated via the sun.
- 8.7 Reversible systems can provide air conditioning comfort cooling; however, when in cooling mode, the system is not considered renewable as it is not taking advantage of a renewable source of energy.

### Heat Pump Appraisal

- 8.8 It is noted that heat pumps perform very well under the new Building Regulations, in consideration of the latest carbon factors, meaning that it will likely have much lower emissions

and environmental impact than alternatives. Heat pumps are therefore proposed for the heated areas of the development.

### Micro Hydro Power

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- 8.9 Micro hydro power systems harness energy from flowing water by using height differences (called “head”); the minimum allowable head is 1.5m and ideally not lower than 10m.

### Micro Hydro Appraisal

- 8.10 There are no surface water courses immediately accessible to the site. Micro hydro is therefore not considered an option for the site, for technical feasibility reasons.

### Micro Wind Power

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- 8.11 Wind turbines are used to generate electricity; with power production determined by the rotation of the blades and being proportionate to the speed of their rotation. The technology is most efficient for constant, low turbulence wind profiles.

### Micro Wind Appraisal

- 8.12 Whilst wind turbines are considered technically feasible in a limited capacity, wind speeds are relatively low and subject to turbulence. The technology is therefore likely to underperform.
- 8.13 Given the uncertainty over performance, the fact that any contribution will likely be quite minor, micro wind turbines are not proposed for the development.

### Solar Systems

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- 8.14 Both solar thermal and photovoltaic (PV) systems convert energy from the sun into a form which can be applied within the building. Solar thermal generates energy for heating (usually for hot water) and PV generates electricity. Hybrid photovoltaic / solar thermal collectors are also available and co-generate heat and power.

### Solar System Appraisal

- 8.15 An extent of PV is proposed for the roof area. This area will be maximised in the context of the available roof space and other demands on the roof area (e.g., green roof).

## 9. Monitor, Verify & Report (Be Seen)

- 9.1 The Applicant is committed to protecting the building users from high prices and is therefore committed to post construction monitoring. This information will be used to encourage building users to minimise energy demand during peak hours. The Applicant will also undertake a programme of aftercare support as part of its handover process, which will also align with the BREEAM Man05 credit requirements.
- 9.2 The systems specified will be efficient and of sufficient size to accommodate peaks in energy demand, and thus short-term battery energy storage is not considered appropriate.
- 9.3 Extensive installation of smart meters, with distribution boards at every other floor and integration with an energy monitoring system, will facilitate the collation of data. Whilst it is expected that all loads will be monitored, the metering strategy has been optimised to reduce the overall embodied carbon of the electrical distribution of the scheme.
- 9.4 The solar PV array will also be installed with monitoring equipment prior to completion and will be maintained at least annually thereafter.

## 10. Summary

- 10.1 This S106 Energy Plan (Revised Energy Statement) provides an overview of the energy strategy in consideration of the site context, anticipated energy requirements and local priorities and initiatives.
- 10.2 A review of Haringey Council's planning policies has identified a number of requirements relating to sustainable development including Local Plan Policy SP4 (*Working Towards a Low Carbon Haringey*). Consideration has also been given to the National and London planning policy framework.

### Energy Strategy

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#### Demand Reduction (Be Lean)

- 10.3 The approach seeks to accommodate the approach of efficient design first on the basis that it is preferable to reduce carbon emissions by reducing energy demand.
- 10.4 It is proposed to achieve a reduction in emissions through efficiency measures in accordance with the 15% target presented in London Plan Policy SI 2 and supported by the Local Plan. This is principally achieved through the selection of highly efficient lighting and control systems.
- 10.5 Mechanical Ventilation Heat Recovery (MVHR) will be provided in the Office/Shop area. It is anticipated that the unit will be a Nuaire 'XBC25-H-EESBA', with a minimum heat exchanger efficiency of 90%.

#### Use Energy More Efficiently (Be Clean)

- 10.6 So called "Clean" technologies are not proposed on site. CHP no longer provides a low carbon option when considered in the context of a decarbonising electricity grid. Furthermore, heat demands are very low and there is no existing DEN in the immediate vicinity of the site.

#### Use Renewable Energy (Be Green)

- 10.7 It is proposed to apply VRF Heat Pumps to the space heating for the office areas only. Other spaces will not be comfort heated. Hot water will be provided by instantaneous electric heaters on the basis that demand is very low and this type of system avoids storage losses (and is therefore lower carbon than an alternative ASHP option). A significant extent (~200sqm) of PV is proposed at roof level to ensure compliance with the 20% planning policy target.
- 10.8 The proposed heat pump specification is the 'Mitsubishi Electric PUMY-P R410A Inverter Heat Pump' (12.5-22.4kW) – PUMY-P112VKM5 with a COP 4.61 and EER 4.48. The datasheet has been provided in the appendices which confirms a nominal heating capacity of 14 kw and cooling capacity of 12.5 kw. The outdoor unit will likely be wall mounted at a high level in the car park.

- 10.9 It is proposed that the PV panels will be mounted southwards to increase their effectiveness and energy production potential. Whilst the exact specification cannot be confirmed at this stage as it will be dependent on the advice of the appointed PV specialist, it is noted that the best performing panels in the market have an efficiency between 22-23% and thus with around 200m<sup>2</sup> of the roof area designated for PV, the delivery of the array will likely be greater than 30 kWp. Overheating can be minimised by using the latest durable technical panels which prevent hot spot formations, however, this will be subject to the appointed PV specialist's decision. The solar PV array will be installed with monitoring equipment prior to completion and will be maintained at least annually thereafter.

#### Monitor, Verify & Report (Be Seen)

- 10.10 The Applicant will undertake a programme of aftercare support as part of its handover process, which will also align with the BREEAM Man05 credit requirements. An energy monitoring system with metering by alternate floor plate will also be installed to allow the collection of data.

#### Carbon Savings

- 10.11 The following table summarise the carbon reductions at each stage of the Energy Hierarchy:

**Figure 10.1 CO<sub>2</sub> Emissions after Each Stage of the Energy Hierarchy (SAP10.2)**

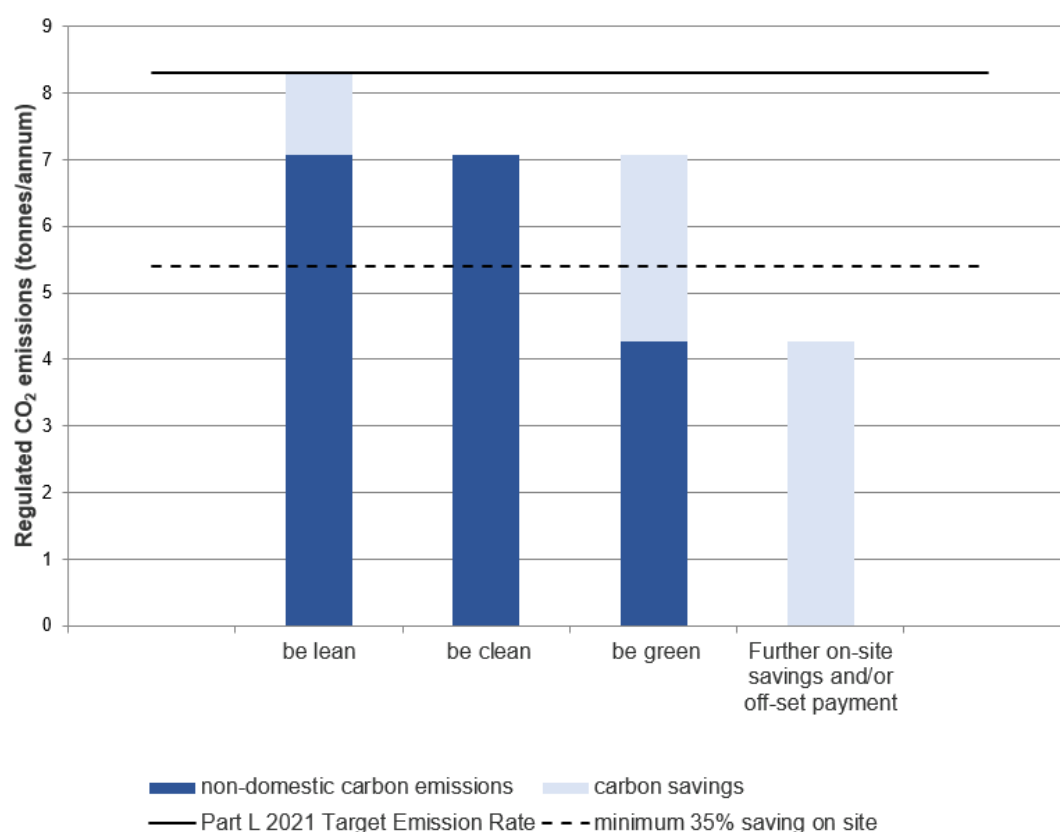
| Step                          | Carbon Dioxide Emissions (Tonnes CO <sub>2</sub> per annum) |             |
|-------------------------------|-------------------------------------------------------------|-------------|
|                               | Regulated                                                   | Unregulated |
| Baseline: Part L 2021         | 8.3                                                         | 1.4         |
| After energy demand reduction | 7.1                                                         | 1.4         |
| After heat network connection | 7.1                                                         | 1.4         |
| After renewable energy        | 4.3                                                         | 1.4         |

**Figure 10.2 Regulated CO<sub>2</sub> Savings from Each Stage of the Energy Hierarchy**

|                                      | Regulated Carbon Dioxide Savings   |     |
|--------------------------------------|------------------------------------|-----|
|                                      | (Tonnes CO <sub>2</sub> per annum) | %   |
| Savings from energy demand reduction | 1.2                                | 15% |
| Savings from heat network            | 0.0                                | 0%  |
| Savings from renewable energy        | 2.8                                | 34% |
| Total Cumulative Savings             | 4.0                                | 49% |

- 10.12 The development will satisfy the Council target for an on-site carbon saving of >35% relative to Part L 2021. Residual emissions will be offset through a Carbon Offset payment. Based on current modelling and the GLA's recommended price of £95 per tonne of carbon dioxide, this is expected to equal £12,160.
- 10.13 As the proposed system is fully electric, the development will effectively become net zero in line with the decarbonisation of the National Grid.
- 10.14 A copy of the GLA Carbon Emission Reporting Spreadsheet is appended to this report outlining the savings at each stage of the Energy Hierarchy.

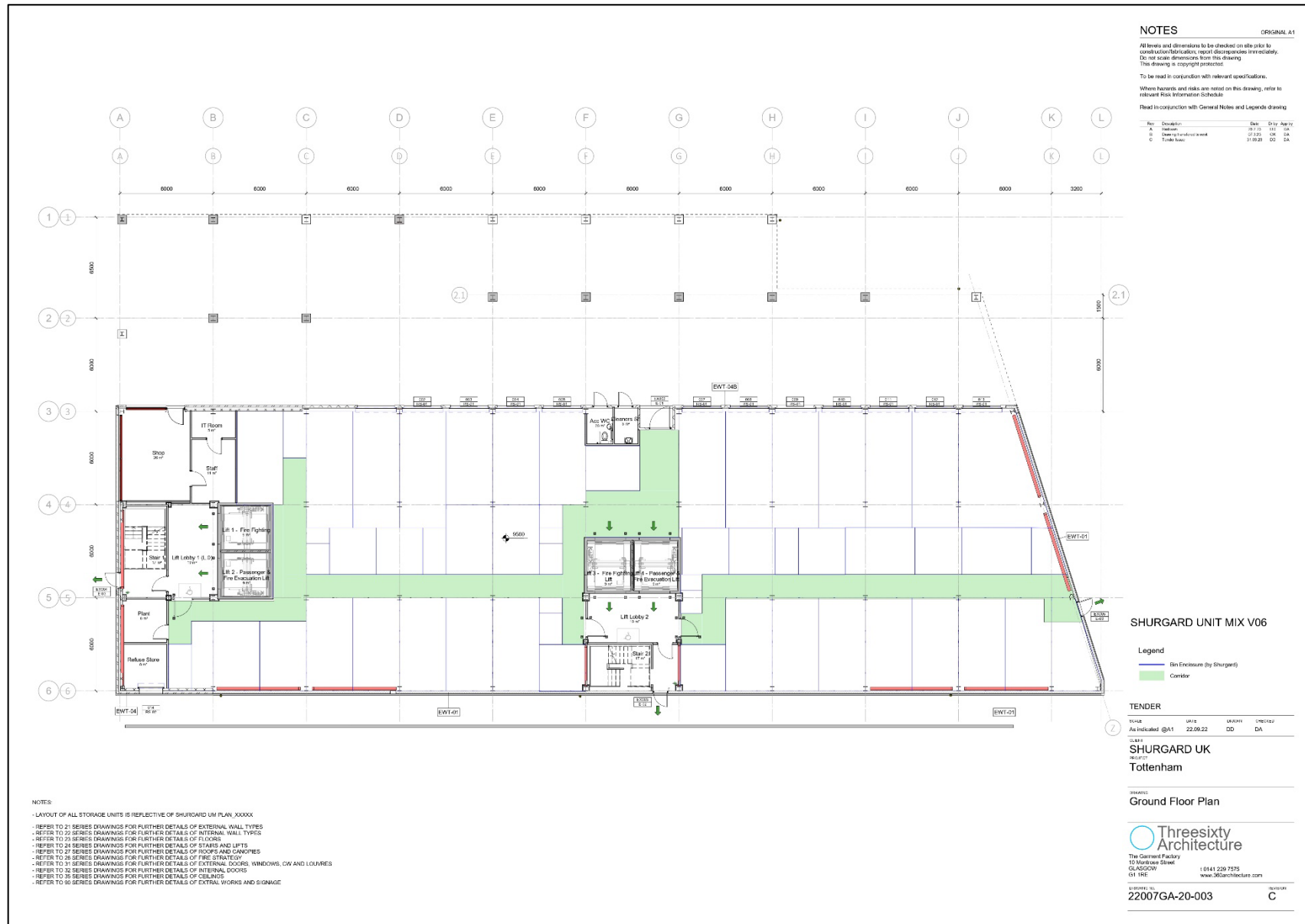
**Figure 10.3 Graphic of Regulated CO<sub>2</sub> Savings from Each Stage of the Energy Hierarchy (Part L 2021)**



- 10.15 Overall, the proposed energy strategy is considered consistent with the National Planning Policy Framework, London Plan and policies of the Council. When implemented, the scheme will provide an efficient and low carbon development.

## Appendices

## **A. Site Plans**



## **B. Key Local Planning Policy Requirements**

### London Plan (2021)

#### Policy SI1 Improving air quality [extract]

[...]

- B) To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:
- 1) Development proposals should not:
    - a) lead to further deterioration of existing poor air quality [...]

#### Policy SI 2 Minimising greenhouse gas emissions

- A) Major development should be net zero-carbon. This means reducing greenhouse gas emissions in operation and minimising both annual and peak energy demand in accordance with the following energy hierarchy:
- 1) be lean: use less energy and manage demand during operation
  - 2) be clean: exploit local energy resources (such as secondary heat) and supply energy efficiently and cleanly
  - 3) be green: maximise opportunities for renewable energy by producing, storing and using renewable energy on-site
  - 4) be seen: monitor, verify and report on energy performance.
- B) Major development proposals should include a detailed energy strategy to demonstrate how the zero-carbon target will be met within the framework of the energy hierarchy.
- C) A minimum on-site reduction of at least 35 per cent beyond Building Regulations is required for major development. Residential development should achieve 10 per cent, and non-residential development should achieve 15 per cent through energy efficiency measures. Where it is clearly demonstrated that the zero-carbon target cannot be fully achieved on-site, any shortfall should be provided, in agreement with the borough, either:
- 1) through a cash in lieu contribution to the borough's carbon offset fund, or
  - 2) off-site provided that an alternative proposal is identified and delivery is certain.
- D) Boroughs must establish and administer a carbon offset fund. Offset fund payments must be ring-fenced to implement projects that deliver carbon reductions. The operation of offset funds should be monitored and reported on annually.
- E) Major development proposals should calculate and minimise carbon emissions from any other part of the development, including plant or equipment, that are not covered by Building Regulations, i.e. unregulated emissions.
- F) Development proposals referable to the Mayor should calculate whole life-cycle carbon emissions through a nationally recognised Whole Life-Cycle Carbon Assessment and demonstrate actions taken to reduce life-cycle carbon emissions.

#### Policy SI3 Energy infrastructure

- A) Boroughs and developers should engage at an early stage with relevant energy companies and bodies to establish the future energy and infrastructure requirements arising from large-scale development proposals such as Opportunity Areas, Town Centres, other growth areas or clusters of significant new development.
- B) Energy masterplans should be developed for large-scale development locations (such as those outlined in Part A and other opportunities) which establish the most effective energy supply options. Energy masterplans should identify:
- 1) major heat loads (including anchor heat loads, with particular reference to sites such as universities, hospitals and social housing)
  - 2) heat loads from existing buildings that can be connected to future phases of a heat network
  - 3) major heat supply plant including opportunities to utilise heat from energy from waste plants

- 4) secondary heat sources, including both environmental and waste heat
- 5) opportunities for low and ambient temperature heat networks
- 6) possible land for energy centres and/or energy storage
- 7) possible heating and cooling network routes
- 8) opportunities for futureproofing utility infrastructure networks to minimise the impact from road works
- 9) infrastructure and land requirements for electricity and gas supplies
- 10) implementation options for delivering feasible projects, considering issues of procurement, funding and risk, and the role of the public sector
- 11) opportunities to maximise renewable electricity generation and incorporate demand-side response measures.

C) Development Plans should:

- 1) identify the need for, and suitable sites for, any necessary energy infrastructure requirements including energy centres, energy storage and upgrades to existing infrastructure
- 2) identify existing heating and cooling networks, identify proposed locations for future heating and cooling networks and identify opportunities for expanding and inter-connecting existing networks as well as establishing new networks.

D) Major development proposals within Heat Network Priority Areas should have a communal low-temperature heating system:

- 1) the heat source for the communal heating system should be selected in accordance with the following heating hierarchy:
  - a) connect to local existing or planned heat networks
  - b) use zero-emission or local secondary heat sources (in conjunction with heat pump, if required)
  - c) use low-emission combined heat and power (CHP) (only where there is a case for CHP to enable the delivery of an area-wide heat network, meet the development's electricity demand and provide demand response to the local electricity network)
  - d) use ultra-low NOx gas boilers
- 2) CHP and ultra-low NOx gas boiler communal or district heating systems should be designed to ensure that they meet the requirements in Part B of Policy SI 1 Improving air quality
- 3) where a heat network is planned but not yet in existence the development should be designed to allow for the cost-effective connection at a later date.

E) Heat networks should achieve good practice design and specification standards for primary, secondary and tertiary systems comparable to those set out in the CIBSE/ADE Code of Practice CP1 or equivalent.

#### Policy SI 4 Managing heat risk

- A) Development proposals should minimise adverse impacts on the urban heat island through design, layout, orientation, materials and the incorporation of green infrastructure.
- B) Major development proposals should demonstrate through an energy strategy how they will reduce the potential for internal overheating and reliance on air conditioning systems in accordance with the following cooling hierarchy:
  - 1) reduce the amount of heat entering a building through orientation, shading, high albedo materials, fenestration, insulation and the provision of green infrastructure
  - 2) minimise internal heat generation through energy efficient design
  - 3) manage the heat within the building through exposed internal thermal mass and high ceilings
  - 4) provide passive ventilation
  - 5) provide mechanical ventilation

- 6) provide active cooling systems.

## Local Planning Policy

### Haringey's Local Plan (2013, updated 2017)

#### Policy SP4 Working Towards a Low Carbon Haringey

Over the life time of the Local Plan, reducing energy use in buildings and working towards a low carbon borough will be one of the key challenges facing Haringey. The Council will promote the measures outlined below to reduce carbon emissions from new and existing buildings.

1. In line with London Plan policy, the Council will promote and require all new developments to take measures to reduce energy use and carbon emissions during design, construction and occupation, by incorporating the following measures:
  - a. From 2011 onwards, all new residential development will achieve a minimum 25% reduction in total (regulated) CO<sub>2</sub> emissions in line with Code for Sustainable Homes Level 4 energy standards, and should aim to achieve Level 6. All new residential development shall be zero carbon from 2016 onwards; and
  - b. From 2011 onwards all new non-residential development shall be built to at least BREEAM "very good" standard and should aim to achieve BREEAM "excellent" or the current nationally agreed standard. All new non-residential development shall be zero carbon from 2019.
2. The Council will promote low- and zero-carbon energy generation through the following measures:
  - a. Requiring all developments to assess, identify and implement, where viable, site-wide and area-wide decentralised energy facilities including the potential to link into a wider network;
  - b. Establishing local networks of decentralised heat and energy facilities by requiring developers to prioritise connection to existing or planned networks where feasible;
  - c. Working with neighbouring boroughs and other partners to explore ways of implementing sub-regional decentralised energy networks including the potential in the Upper Lee Valley Opportunity Area; and
  - d. All new developments are required, where viable, to achieve a reduction in predicted carbon dioxide emissions of 20% from on site renewable energy regeneration, which can include connections to local sources of decentralised renewable energy.

### Haringey's Development Management DPD (June 2017)

#### Policy DM21: Sustainable Design, Layout and Construction

- A. All new development, including building and landscape works, will be expected to consider and implement sustainable design, layout and construction techniques. Proposals should:
  - a. Apply the energy hierarchy to minimise energy use in order to meet, and if possible exceed, minimum carbon dioxide reduction requirements;
  - b. Apply the cooling hierarchy to reduce the potential for overheating and limit reliance on mechanical air conditioning systems;
  - c. Maximise opportunities to enhance biodiversity on-site, including through appropriate landscaping, Sustainable Drainage Systems, living roofs and green walls
  - d. Wherever possible, use building materials with high environmental performance ratings; and
  - e. Seek opportunities for locally sourced labour.
- B. The Council will support appropriate measures to sustainably retrofit existing homes and non-residential buildings.

- C. Proposals that fail to demonstrate adequate consideration for sustainable design, layout and construction techniques will be resisted.
- D. Consideration will be given to the use of carbon offset payments, to be secured by planning obligations, where it can be demonstrated that proposals are unable to meet carbon dioxide emission reduction targets on-site.

#### **Policy DM22 Decentralised Energy**

- A. Subject to other policy requirements, proposals that contribute to the provision and use of Decentralised Energy network infrastructure will be supported.

##### **Communal energy systems**

- B. All development that incorporates site-wide communal energy systems should examine opportunities for extending such systems, irrespective of whether it is connected to a DE network.
- C. All development that incorporates site-wide communal energy systems should optimise opportunities for extending such systems beyond the site boundary to supply energy to neighbouring existing and planned future developments.

##### **Existing and planned future DE networks**

- D. All development proposals should prioritise connection to existing or planned future DE networks.
- E. All major development located within 500 metres of an existing DE Network, and minor new-build development located within 25 metres, will be expected to secure connection to that network subject to demonstration of technical feasibility and financial viability.
- F. All major development located within 500 metres of a planned future DE Network, which is considered by the Council likely to be operational within 3 years of a grant of planning permission, will be expected to secure connection to that network subject to demonstration of technical feasibility and financial viability.

##### **DE network 'connection zones'**

- G. All major development located within 500 metres of a DE network 'connection zone' should be designed for connection to a DE network.
- H. All minor new-build development located within 25 metres of a DE network 'connection zone' should be designed for connection to a DE network.

##### **Customer charters**

- I. Where site-wide communal and district heating systems are operational, the Council will strongly encourage heat and energy service providers to enter into customer charters with domestic and micro-business customers.

## C. Heat Pump Specification Details

**Mitsubishi Electric PUMY-P R410A Inverter Heat Pump (12.5-22.4kW): PUMY-P112VKM5**

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## **D. GLA Spreadsheet**

## Part L 2021 Performance

### Residential

**Table 1:** Carbon Dioxide Emissions after each stage of the Energy Hierarchy for residential buildings

|                                                                         | Carbon Dioxide Emissions for residential buildings<br>(Tonnes CO <sub>2</sub> per annum) |             |
|-------------------------------------------------------------------------|------------------------------------------------------------------------------------------|-------------|
|                                                                         | Regulated                                                                                | Unregulated |
| Baseline: Part L 2021 of the Building Regulations Compliant Development | 0.0                                                                                      |             |
| After energy demand reduction (be lean)                                 | 0.0                                                                                      |             |
| After heat network connection (be clean)                                | 0.0                                                                                      |             |
| After renewable energy (be green)                                       | 0.0                                                                                      |             |

**Table 2:** Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for residential buildings

|                                               | Regulated residential carbon dioxide savings |           |
|-----------------------------------------------|----------------------------------------------|-----------|
|                                               | (Tonnes CO <sub>2</sub> per annum)           | (%)       |
| Be lean: savings from energy demand reduction | 0.0                                          | 0%        |
| Be clean: savings from heat network           | 0.0                                          | 0%        |
| Be green: savings from renewable energy       | 0.0                                          | 0%        |
| <b>Cumulative on site savings</b>             | <b>0.0</b>                                   | <b>0%</b> |
| Annual savings from off-set payment           | 0.0                                          | -         |
| (Tonnes CO <sub>2</sub> )                     |                                              |           |
| Cumulative savings for off-set payment        | 0                                            | -         |
| Cash in-lieu contribution (£)                 | 0                                            |           |

\*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development'

### Non-residential

**Table 3:** Carbon Dioxide Emissions after each stage of the Energy Hierarchy for non-residential buildings

|                                                                         | Carbon Dioxide Emissions for non-residential buildings<br>(Tonnes CO <sub>2</sub> per annum) |             |
|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|-------------|
|                                                                         | Regulated                                                                                    | Unregulated |
| Baseline: Part L 2021 of the Building Regulations Compliant Development | 8.3                                                                                          | 1.4         |
| After energy demand reduction (be lean)                                 | 7.1                                                                                          | 1.4         |
| After heat network connection (be clean)                                | 7.1                                                                                          | 1.4         |
| After renewable energy (be green)                                       | 4.3                                                                                          | 1.4         |

**Table 4:** Regulated Carbon Dioxide savings from each stage of the Energy Hierarchy for non-residential buildings

|                                               | Regulated non-residential carbon dioxide savings |            |
|-----------------------------------------------|--------------------------------------------------|------------|
|                                               | (Tonnes CO <sub>2</sub> per annum)               | (%)        |
| Be lean: savings from energy demand reduction | 1.2                                              | 15%        |
| Be clean: savings from heat network           | 0.0                                              | 0%         |
| Be green: savings from renewable energy       | 2.8                                              | 34%        |
| <b>Total Cumulative Savings</b>               | <b>4.0</b>                                       | <b>49%</b> |
| Annual savings from off-set payment           | 4.3                                              | -          |
| (Tonnes CO <sub>2</sub> )                     |                                                  |            |
| Cumulative savings for off-set payment        | 128                                              | -          |
| Cash in-lieu contribution (£)                 | 12,160                                           |            |

\*carbon price is based on GLA recommended price of £95 per tonne of carbon dioxide unless Local Planning Authority price is inputted in the 'Development'

## **E. Indicative Energy Model Outputs (Be Lean)**

# BRUKL Output Document

Compliance with England Building Regulations Part L 2021



Project name

**Garman Road - Be Lean**

As designed

Date: Thu Jun 15 10:35:08 2023

## Administrative information

### Building Details

Address: 45-47 Garman Road, Tottenham, N17 0UR

### Certifier details

Name: Ensphere Group Ltd

Telephone number: +44 (0) 20 7846 9040

Address: 55A Catherine Place, London, SW1E 6DY

### Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.21

BRUKL compliance module version: v6.1.e.1

Foundation area [m<sup>2</sup>]: 46.65

## The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

|                                                                                        |                         |
|----------------------------------------------------------------------------------------|-------------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> ·annum   | 0.72                    |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> ·annum | 0.63                    |
| Target primary energy rate (TPER), kWh <sub>u</sub> /m <sup>2</sup> ·annum             | 7.85                    |
| Building primary energy rate (BPER), kWh <sub>u</sub> /m <sup>2</sup> ·annum           | 6.84                    |
| Do the building's emission and primary energy rates exceed the targets?                | BER <= TER BPER <= TPER |

## The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

| Fabric element                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | U <sub>a</sub> Limit | U <sub>a</sub> Calc. | U <sub>i</sub> Calc. | First surface with maximum value      |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------|----------------------|----------------------|---------------------------------------|
| Walls*                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.26                 | 0.2                  | 0.21                 | GF000002_W0_A0                        |
| Floors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 0.18                 | 0.12                 | 0.12                 | GF000002_F                            |
| Pitched roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 0.16                 | -                    | -                    | No heat loss pitched roofs            |
| Flat roofs                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 0.18                 | 0.12                 | 0.12                 | GF000002_C_A0                         |
| Windows** and roof windows                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 1.6                  | 1.4                  | 1.4                  | GF000002_W-1_O0                       |
| Rooflights***                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 2.2                  | -                    | -                    | No external rooflights                |
| Personnel doors <sup>Δ</sup>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1.6                  | -                    | -                    | No external personnel doors           |
| Vehicle access & similar large doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 1.3                  | -                    | -                    | No external vehicle access doors      |
| High usage entrance doors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 3                    | -                    | -                    | No external high usage entrance doors |
| <small>U<sub>a</sub> Limit = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]<br/> U<sub>a</sub> Calc. = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]<br/> U<sub>i</sub> Calc. = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]<br/> * Automatic U-value check by the tool does not apply to certain walls whose limiting standard is similar to that for windows.<br/> ** Display windows and similar glazing are excluded from the U-value check. *** Values for rooflights refer to the horizontal position.<br/> <sup>Δ</sup> For fire doors, limiting U-value is 1.8 W/m<sup>2</sup>K<br/> NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool. </small> |                      |                      |                      |                                       |
| Air permeability                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Limiting standard    | This building        |                      |                                       |
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 8                    | 3                    |                      |                                       |

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## Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- ASHP space heating

|                | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|----------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system    | 2.64               | 6.45               | -                  | -             | -             |
| Standard value | 2.5*               | 5                  | N/A                | N/A           | N/A           |

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

### 1- SYST0002-DHW

|                | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|----------------|--------------------------|-----------------------------------------|
| This building  | 1                        | 0.01                                    |
| Standard value | 1                        | N/A                                     |

### Zone-level mechanical ventilation, exhaust, and terminal units

| ID | System type in the Approved Documents                                 |
|----|-----------------------------------------------------------------------|
| A  | Local supply or extract ventilation units                             |
| B  | Zonal supply system where the fan is remote from the zone             |
| C  | Zonal extract system where the fan is remote from the zone            |
| D  | Zonal balanced supply and extract ventilation system                  |
| E  | Local balanced supply and extract ventilation units                   |
| F  | Other local ventilation units                                         |
| G  | Fan assisted terminal variable air volume units                       |
| H  | Fan coil units                                                        |
| I  | Kitchen extract with the fan remote from the zone and a grease filter |

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

| Zone name    | ID of system type | SFP [W/(l/s)] |   |   |   |     |   |   |   |   | HR efficiency |          |
|--------------|-------------------|---------------|---|---|---|-----|---|---|---|---|---------------|----------|
|              |                   | A             | B | C | D | E   | F | G | H | I | Zone          | Standard |
| GF - SHOP    |                   | 0.3           | - | - | - | 0.3 | - | - | - | - | 0.9           | N/A      |
| GF - IT ROOM |                   | 0.3           | - | - | - | 0.3 | - | - | - | - | 0.9           | N/A      |
| GF - OFFICE  |                   | 0.3           | - | - | - | 0.3 | - | - | - | - | 0.9           | N/A      |
| GF - TOILET  |                   | 0.3           | - | - | - | -   | - | - | - | - | -             | N/A      |

| General lighting and display lighting |                | General luminaire |  | Display light source |                                   |
|---------------------------------------|----------------|-------------------|--|----------------------|-----------------------------------|
| Zone name                             |                | Efficacy [lm/W]   |  | Efficacy [lm/W]      | Power density [W/m <sup>2</sup> ] |
|                                       | Standard value | 95                |  | 80                   | 0.3                               |
| GF - SHOP                             |                | 120               |  | 100                  | 1.35                              |
| GF - IT ROOM                          |                | 120               |  | -                    | -                                 |
| GF - OFFICE                           |                | 120               |  | -                    | -                                 |
| GF - REFUSE                           |                | 120               |  | -                    | -                                 |
| GF - PLANT                            |                | 120               |  | -                    | -                                 |
| GF - CIRCULATION                      |                | 120               |  | -                    | -                                 |

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| General lighting and display lighting |                | General luminaire |                 | Display light source |  |
|---------------------------------------|----------------|-------------------|-----------------|----------------------|--|
| Zone name                             | Standard value | Efficacy [lm/W]   | Efficacy [lm/W] | Power density [W/m²] |  |
| GF - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| GF - WAREHOUSE                        | 130            | -                 | -               | -                    |  |
| GF - TOILET                           | 120            | -                 | -               | -                    |  |
| GF - CLEANERS                         | 120            | -                 | -               | -                    |  |
| 1F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 1F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 1F: WAREHOUSE                         | 130            | -                 | -               | -                    |  |
| 2F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 2F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 2F: WAREHOUSE                         | 130            | -                 | -               | -                    |  |
| 3F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 3F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 3F: WAREHOUSE                         | 130            | -                 | -               | -                    |  |
| 4F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 4F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 4F: WAREHOUSE                         | 130            | -                 | -               | -                    |  |
| 5F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 5F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 5F: WAREHOUSE                         | 130            | -                 | -               | -                    |  |
| 6F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 6F - CIRCULATION                      | 120            | -                 | -               | -                    |  |
| 6F: WAREHOUSE                         | 130            | -                 | -               | -                    |  |

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

| Zone         | Solar gain limit exceeded? (%) | Internal blinds used? |
|--------------|--------------------------------|-----------------------|
| GF - SHOP    | YES (+75.2%)                   | NO                    |
| GF - IT ROOM | N/A                            | N/A                   |
| GF - OFFICE  | N/A                            | N/A                   |
| GF - REFUSE  | N/A                            | N/A                   |

#### Regulation 25A: Consideration of high efficiency alternative energy systems

|                                                                                        |     |
|----------------------------------------------------------------------------------------|-----|
| Were alternative energy systems considered and analysed as part of the design process? | YES |
| Is evidence of such assessment available as a separate submission?                     | YES |
| Are any such measures included in the proposed design?                                 | YES |

### Technical Data Sheet (Actual vs. Notional Building)

| Building Global Parameters   |         |          | Building Use |                                                         |
|------------------------------|---------|----------|--------------|---------------------------------------------------------|
|                              | Actual  | Notional | % Area       | Building Type                                           |
| Floor area [m²]              | 11531.2 | 11531.2  |              | Retail/Financial and Professional Services              |
| External area [m²]           | 29817.9 | 29817.8  |              | Restaurants and Cafes/Drinking Establishments/Takeaways |
| Weather                      | LON     | LON      |              | Offices and Workshop Businesses                         |
| Infiltration [m³/hm² @ 50Pa] | 3       | 5        |              | General Industrial and Special Industrial Groups        |
| Average conductance [W/K]    | 4328.12 | 4980.33  | 100          | Storage or Distribution                                 |
| Average U-value [W/m²K]      | 0.15    | 0.17     |              | Hotels                                                  |
| Alpha value* [%]             | 8.28    | 19.7     |              | Residential Institutions: Hospitals and Care Homes      |

\* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

#### Energy Consumption by End Use [kWh/m²]

|            | Actual | Notional |
|------------|--------|----------|
| Heating    | 0.06   | 0.11     |
| Cooling    | 0.05   | 0.03     |
| Auxiliary  | 0.01   | 0.02     |
| Lighting   | 4.46   | 5.28     |
| Hot water  | 0.06   | 0.02     |
| Equipment* | 0.91   | 0.91     |
| TOTAL**    | 4.64   | 5.45     |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.  
\*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

#### Energy Production by Technology [kWh/m²]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 0      | 0.13     |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 0      | 0.13     |

#### Energy & CO<sub>2</sub> Emissions Summary

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 110.85 | 119.44   |
| Primary energy [kWh <sub>TE</sub> /m²] | 6.84   | 7.85     |
| Total emissions [kg/m²]                | 0.63   | 0.72     |

| HVAC Systems Performance                                                          |                   |                   |                    |                    |                   |              |               |                  |                  |
|-----------------------------------------------------------------------------------|-------------------|-------------------|--------------------|--------------------|-------------------|--------------|---------------|------------------|------------------|
| System Type                                                                       | Heat dem<br>MJ/m2 | Cool dem<br>MJ/m2 | Heat con<br>kWh/m2 | Cool con<br>kWh/m2 | Aux con<br>kWh/m2 | Heat<br>SSEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                   |                   |                    |                    |                   |              |               |                  |                  |
| Actual                                                                            | 130.9             | 221.5             | 14                 | 12.8               | 2.4               | 2.59         | 4.82          | 2.64             | 6.45             |
| Notional                                                                          | 248               | 108.1             | 26.1               | 6.8                | 5.6               | 2.64         | 4.4           | ----             | ----             |
| [ST] No Heating or Cooling                                                        |                   |                   |                    |                    |                   |              |               |                  |                  |
| Actual                                                                            | 90                | 19.9              | 0                  | 0                  | 0                 | 0            | 0             | 0                | 0                |
| Notional                                                                          | 100.2             | 18.2              | 0                  | 0                  | 0                 | 0            | 0             | ----             | ----             |

#### Key to terms

Heat dem [MJ/m2] = Heating energy demand  
 Cool dem [MJ/m2] = Cooling energy demand  
 Heat con [kWh/m2] = Heating energy consumption  
 Cool con [kWh/m2] = Cooling energy consumption  
 Aux con [kWh/m2] = Auxiliary energy consumption  
 Heat SSEFF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)  
 Cool SSEER = Cooling system seasonal energy efficiency ratio  
 Heat gen SSEFF = Heating generator seasonal efficiency  
 Cool gen SSEER = Cooling generator seasonal energy efficiency ratio  
 ST = System type  
 HS = Heat source  
 HFT = Heating fuel type  
 CFT = Cooling fuel type

## **F. Indicative Energy Model Outputs (Be Green)**

# BRUKL Output Document

HM Government  
Compliance with England Building Regulations Part L 2021

Project name

**Garman Road - Be Green**

As designed

Date: Thu Jun 15 10:27:40 2023

## Administrative information

### Building Details

Address: 45-47 Garman Road, Tottenham, N17 0UR

### Certification tool

Calculation engine: SBEM

Calculation engine version: v6.1.e.0

Interface to calculation engine: Virtual Environment

Interface to calculation engine version: v7.0.21

BRUKL compliance module version: v6.1.e.1

### Certifier details

Name: Ensphere Group Ltd

Telephone number: +44 (0) 20 7846 9040

Address: 55A Catherine Place, London, SW1E 6DY

Foundation area [m<sup>2</sup>]: 46.65

## The CO<sub>2</sub> emission and primary energy rates of the building must not exceed the targets

|                                                                                       |                       |
|---------------------------------------------------------------------------------------|-----------------------|
| Target CO <sub>2</sub> emission rate (TER), kgCO <sub>2</sub> /m <sup>2</sup> annum   | 0.72                  |
| Building CO <sub>2</sub> emission rate (BER), kgCO <sub>2</sub> /m <sup>2</sup> annum | 0.37                  |
| Target primary energy rate (TPER), kWh <sub>m</sub> /m <sup>2</sup> annum             | 7.85                  |
| Building primary energy rate (BPER), kWh <sub>m</sub> /m <sup>2</sup> annum           | 3.85                  |
| Do the building's emission and primary energy rates exceed the targets?               | BER ≤ TER BPER ≤ TPER |

## The performance of the building fabric and fixed building services should achieve reasonable overall standards of energy efficiency

| Fabric element                       | U <sub>o</sub> Limit | U <sub>o</sub> Calc | U <sub>i</sub> Calc | First surface with maximum value      |
|--------------------------------------|----------------------|---------------------|---------------------|---------------------------------------|
| Walls*                               | 0.26                 | 0.2                 | 0.21                | GF000002_W0_A0                        |
| Floors                               | 0.18                 | 0.12                | 0.12                | GF000002_F                            |
| Pitched roofs                        | 0.16                 | -                   | -                   | No heat loss pitched roofs            |
| Flat roofs                           | 0.18                 | 0.12                | 0.12                | GF000002_C_A0                         |
| Windows** and roof windows           | 1.6                  | 1.4                 | 1.4                 | GF000002_W-1_O0                       |
| Rooflights***                        | 2.2                  | -                   | -                   | No external rooflights                |
| Personnel doors <sup>Δ</sup>         | 1.6                  | -                   | -                   | No external personnel doors           |
| Vehicle access & similar large doors | 1.3                  | -                   | -                   | No external vehicle access doors      |
| High usage entrance doors            | 3                    | -                   | -                   | No external high usage entrance doors |

U<sub>o</sub> Limit = Limiting area-weighted average U-values [W/(m<sup>2</sup>K)]

U<sub>o</sub> Calc = Calculated maximum individual element U-values [W/(m<sup>2</sup>K)]

U<sub>i</sub> Calc = Calculated area-weighted average U-values [W/(m<sup>2</sup>K)]

\* Automatic U-value check by the tool does not apply to curtain walls whose limiting standard is similar to that for windows.

\*\* Display windows and similar glazing are excluded from the U-value check. \*\*\* Values for rooflights refer to the horizontal position.

<sup>Δ</sup> For the doors, limiting U-value is 1.8 W/m<sup>2</sup>K

NB: Neither roof ventilators (inc. smoke vents) nor swimming pool basins are modelled or checked against the limiting standards by the tool.

| Air permeability                             | Limiting standard | This building |
|----------------------------------------------|-------------------|---------------|
| m <sup>3</sup> /(h.m <sup>2</sup> ) at 50 Pa | 8                 | 3             |

## Building services

For details on the standard values listed below, system-specific guidance, and additional regulatory requirements, refer to the Approved Documents.

|                                                                                              |       |
|----------------------------------------------------------------------------------------------|-------|
| Whole building lighting automatic monitoring & targeting with alarms for out-of-range values | YES   |
| Whole building electric power factor achieved by power factor correction                     | >0.95 |

### 1- ASHP space heating

|                | Heating efficiency | Cooling efficiency | Radiant efficiency | SFP [W/(l/s)] | HR efficiency |
|----------------|--------------------|--------------------|--------------------|---------------|---------------|
| This system    | 3.93               | 6.45               | -                  | -             | -             |
| Standard value | 2.5*               | 5                  | N/A                | N/A           | N/A           |

Automatic monitoring & targeting with alarms for out-of-range values for this HVAC system

YES

\* Standard shown is for all types >12 kW output, except absorption and gas engine heat pumps.

### 1- SYST0002-DHW

|                | Water heating efficiency | Storage loss factor [kWh/litre per day] |
|----------------|--------------------------|-----------------------------------------|
| This building  | 1                        | 0.01                                    |
| Standard value | 1                        | N/A                                     |

### Zone-level mechanical ventilation, exhaust, and terminal units

| ID | System type in the Approved Documents                                 |
|----|-----------------------------------------------------------------------|
| A  | Local supply or extract ventilation units                             |
| B  | Zonal supply system where the fan is remote from the zone             |
| C  | Zonal extract system where the fan is remote from the zone            |
| D  | Zonal balanced supply and extract ventilation system                  |
| E  | Local balanced supply and extract ventilation units                   |
| F  | Other local ventilation units                                         |
| G  | Fan assisted terminal variable air volume units                       |
| H  | Fan coil units                                                        |
| I  | Kitchen extract with the fan remote from the zone and a grease filter |

NB: Limiting SFP may be increased by the amounts specified in the Approved Documents if the installation includes particular components.

| Zone name    | ID of system type | SFP [W/(l/s)] |   |   |   |     |   |   |   |   | HR efficiency |          |
|--------------|-------------------|---------------|---|---|---|-----|---|---|---|---|---------------|----------|
|              |                   | A             | B | C | D | E   | F | G | H | I | Zone          | Standard |
| GF - SHOP    | Standard value    | 0.3           | - | - | - | 0.3 | - | - | - | - | 0.9           | N/A      |
| GF - IT ROOM |                   | 0.3           | - | - | - | 0.3 | - | - | - | - | 0.9           | N/A      |
| GF - OFFICE  |                   | 0.3           | - | - | - | 0.3 | - | - | - | - | 0.9           | N/A      |
| GF - TOILET  |                   | 0.3           | - | - | - | -   | - | - | - | - | -             | N/A      |

| General lighting and display lighting |                | General luminaire |  | Display light source |                                   |
|---------------------------------------|----------------|-------------------|--|----------------------|-----------------------------------|
| Zone name                             |                | Efficacy [lm/W]   |  | Efficacy [lm/W]      | Power density [W/m <sup>2</sup> ] |
|                                       | Standard value | 95                |  | 80                   | 0.3                               |
| GF - SHOP                             |                | 120               |  | 100                  | 1.35                              |
| GF - IT ROOM                          |                | 120               |  | -                    | -                                 |
| GF - OFFICE                           |                | 120               |  | -                    | -                                 |
| GF - REFUSE                           |                | 120               |  | -                    | -                                 |
| GF - PLANT                            |                | 120               |  | -                    | -                                 |
| GF - CIRCULATION                      |                | 120               |  | -                    | -                                 |

| General lighting and display lighting |                   |                 |                      |
|---------------------------------------|-------------------|-----------------|----------------------|
| Zone name                             | General luminaire |                 | Display light source |
|                                       | Efficacy [lm/W]   | Efficacy [lm/W] | Power density [W/m²] |
| Standard value                        | 95                | 80              | 0.3                  |
| GF - CIRCULATION                      | 120               | -               | -                    |
| GF - WAREHOUSE                        | 130               | -               | -                    |
| GF - TOILET                           | 120               | -               | -                    |
| GF - CLEANERS                         | 120               | -               | -                    |
| 1F - CIRCULATION                      | 120               | -               | -                    |
| 1F - CIRCULATION                      | 120               | -               | -                    |
| 1F: WAREHOUSE                         | 130               | -               | -                    |
| 2F - CIRCULATION                      | 120               | -               | -                    |
| 2F - CIRCULATION                      | 120               | -               | -                    |
| 2F: WAREHOUSE                         | 130               | -               | -                    |
| 3F - CIRCULATION                      | 120               | -               | -                    |
| 3F - CIRCULATION                      | 120               | -               | -                    |
| 3F: WAREHOUSE                         | 130               | -               | -                    |
| 4F - CIRCULATION                      | 120               | -               | -                    |
| 4F - CIRCULATION                      | 120               | -               | -                    |
| 4F: WAREHOUSE                         | 130               | -               | -                    |
| 5F - CIRCULATION                      | 120               | -               | -                    |
| 5F - CIRCULATION                      | 120               | -               | -                    |
| 5F: WAREHOUSE                         | 130               | -               | -                    |
| 6F - CIRCULATION                      | 120               | -               | -                    |
| 6F - CIRCULATION                      | 120               | -               | -                    |
| 6F: WAREHOUSE                         | 130               | -               | -                    |

The spaces in the building should have appropriate passive control measures to limit solar gains in summer

| Zone         | Solar gain limit exceeded? (%) | Internal blinds used? |
|--------------|--------------------------------|-----------------------|
| GF - SHOP    | YES (+75.2%)                   | NO                    |
| GF - IT ROOM | N/A                            | N/A                   |
| GF - OFFICE  | N/A                            | N/A                   |
| GF - REFUSE  | N/A                            | N/A                   |

#### Regulation 25A: Consideration of high efficiency alternative energy systems

|                                                                                        |     |
|----------------------------------------------------------------------------------------|-----|
| Were alternative energy systems considered and analysed as part of the design process? | YES |
| Is evidence of such assessment available as a separate submission?                     | YES |
| Are any such measures included in the proposed design?                                 | YES |

### Technical Data Sheet (Actual vs. Notional Building)

| Building Global Parameters   |         |          | Building Use |                                                         |
|------------------------------|---------|----------|--------------|---------------------------------------------------------|
|                              | Actual  | Notional | % Area       | Building Type                                           |
| Floor area [m²]              | 11531.2 | 11531.2  |              | Retail/Financial and Professional Services              |
| External area [m²]           | 29817.9 | 29817.8  |              | Restaurants and Cafes/Drinking Establishments/Takeaways |
| Weather                      | LON     | LON      |              | Offices and Workshop Businesses                         |
| Infiltration [m³/hm² @ 50Pa] | 3       | 5        |              | General Industrial and Special Industrial Groups        |
| Average conductance [W/K]    | 4328.12 | 4980.33  | 100          | Storage or Distribution                                 |
| Average U-value [W/m²K]      | 0.15    | 0.17     |              | Hotels                                                  |
| Alpha value* [%]             | 8.28    | 19.7     |              | Residential Institutions: Hospitals and Care Homes      |

\* Percentage of the building's average heat transfer coefficient which is due to thermal bridging

Residential Institutions: Residential Schools  
Residential Institutions: Universities and Colleges  
Secure Residential Institutions  
Residential Spaces  
Non-residential Institutions: Community/Day Centre  
Non-residential Institutions: Libraries, Museums, and Galleries  
Non-residential Institutions: Education  
Non-residential Institutions: Primary Health Care Building  
Non-residential Institutions: Crown and County Courts  
General Assembly and Leisure, Night Clubs, and Theatres  
Others: Passenger Terminals  
Others: Emergency Services  
Others: Miscellaneous 24hr Activities  
Others: Car Parks 24 hrs  
Others: Stand Alone Utility Block

#### Energy Consumption by End Use [kWh/m²]

|            | Actual | Notional |
|------------|--------|----------|
| Heating    | 0.04   | 0.11     |
| Cooling    | 0.05   | 0.03     |
| Auxiliary  | 0.01   | 0.02     |
| Lighting   | 4.46   | 5.28     |
| Hot water  | 0.06   | 0.02     |
| Equipment* | 0.91   | 0.91     |
| TOTAL**    | 4.62   | 5.45     |

\* Energy used by equipment does not count towards the total for consumption or calculating emissions.  
\*\* Total is net of any electrical energy displaced by CHP generators, if applicable.

#### Energy Production by Technology [kWh/m²]

|                       | Actual | Notional |
|-----------------------|--------|----------|
| Photovoltaic systems  | 2.01   | 0.13     |
| Wind turbines         | 0      | 0        |
| CHP generators        | 0      | 0        |
| Solar thermal systems | 0      | 0        |
| Displaced electricity | 2.01   | 0.13     |

#### Energy & CO<sub>2</sub> Emissions Summary

|                                        | Actual | Notional |
|----------------------------------------|--------|----------|
| Heating + cooling demand [MJ/m²]       | 110.85 | 119.44   |
| Primary energy [kWh <sub>pe</sub> /m²] | 3.85   | 7.85     |
| Total emissions [kg/m²]                | 0.37   | 0.72     |

| HVAC Systems Performance                                                          |                               |                               |                                |                                |                               |               |               |                  |                  |
|-----------------------------------------------------------------------------------|-------------------------------|-------------------------------|--------------------------------|--------------------------------|-------------------------------|---------------|---------------|------------------|------------------|
| System Type                                                                       | Heat dem<br>MJ/m <sup>2</sup> | Cool dem<br>MJ/m <sup>2</sup> | Heat con<br>kWh/m <sup>2</sup> | Cool con<br>kWh/m <sup>2</sup> | Aux con<br>kWh/m <sup>2</sup> | Heat<br>SSEEF | Cool<br>SSEER | Heat gen<br>SEFF | Cool gen<br>SEER |
| [ST] Split or multi-split system, [HS] ASHP, [HFT] Electricity, [CFT] Electricity |                               |                               |                                |                                |                               |               |               |                  |                  |
| Actual                                                                            | 130.9                         | 221.5                         | 9.4                            | 12.8                           | 2.4                           | 3.86          | 4.82          | 3.93             | 6.45             |
| Notional                                                                          | 248                           | 108.1                         | 26.1                           | 6.8                            | 5.6                           | 2.64          | 4.4           | ----             | ----             |
| [ST] No Heating or Cooling                                                        |                               |                               |                                |                                |                               |               |               |                  |                  |
| Actual                                                                            | 90                            | 19.9                          | 0                              | 0                              | 0                             | 0             | 0             | 0                | 0                |
| Notional                                                                          | 100.2                         | 18.2                          | 0                              | 0                              | 0                             | 0             | 0             | ----             | ----             |

#### Key to terms

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 Cool dem [MJ/m<sup>2</sup>] = Cooling energy demand  
 Heat con [kWh/m<sup>2</sup>] = Heating energy consumption  
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 Heat SSEEF = Heating system seasonal efficiency (for notional building, value depends on activity glazing class)  
 Cool SSEER = Cooling system seasonal energy efficiency ratio  
 Heat gen SSEEF = Heating generator seasonal efficiency  
 Cool gen SSEER = Cooling generator seasonal energy efficiency ratio  
 ST = System type  
 HS = Heat source  
 HFT = Heating fuel type  
 CFT = Cooling fuel type

## **G. General Notes**

The report is based on information available at the time of the writing and discussions with the client during any project meetings. Where any data supplied by the client or from other sources have been used it has been assumed that the information is correct. No responsibility can be accepted by Ensphere Group Ltd for inaccuracies in the data supplied by any other party.

The review of planning policy and other requirements does not constitute a detailed review. Its purpose is as a guide to provide the context for the development and to determine the likely requirements of the Local Authority.

No site visits have been carried out, unless otherwise specified.

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